Kramer Electronics, Ltd.

USER MANUAL

Models:

WP-561 ***HDMI Line Transmitter***

WP-562 ***HDMI Line Receiver***

PT-561 ***HDMI Line Transmitter***

PT-562 ***HDMI Line Receiver***

Contents

1	**Introduction**	**1**
2	**Getting Started**	**1**
2.1	Quick Start	2
3	**Overview**	**3**
3.1	WP-561 / PT-561 HDMI Line Transmitter	3
3.2	WP-562 / PT-562 HDMI Line Receiver	4
3.3	About the Power Connect™ Feature	4
3.4	Shielded Twisted Pair (STP) / Unshielded Twisted Pair (UTP)	4
3.5	About HDMI	5
3.6	Achieving the Best Performance	6
4	**Your WP-561, WP-562 HDMI Transmitter/Receiver Pair**	**6**
4.1	Your WP-561 HDMI Line Transmitter	6
4.2	Your WP-562 HDMI Line Receiver	8
5	**Connecting the WP-561/WP-562 Transmitter/Receiver Pair**	**9**
5.1	Wiring the CAT 5 LINE IN / LINE OUT RJ-45 Connectors	10
6	**Your PT-561, PT-562 HDMI Transmitter/Receiver Pair**	**11**
6.1	Your PT-561 HDMI Line Transmitter	11
6.2	Your PT-562 HDMI Line Receiver	12
7	**Connecting the PT-561 and PT-562**	**12**
8	**Technical Specifications**	**14**

Figures

Figure 1: WP-561 Belgian/German Model Functions 6
Figure 2: WP-561 UK/European Model Functions 7
Figure 3: WP-561 US Model Functions 7
Figure 4: WP-562 Belgian/German Model Functions 8
Figure 5: WP-562 UK/European Model Functions 8
Figure 6: WP-562 US Model Functions 9
Figure 7: CAT 5 PINOUT 10
Figure 8: PT-561 HDMI Line Transmitter 11
Figure 9: PT-562 HDMI Line Receiver 12
Figure 10: Connecting the PT-561 / PT-562 HDMI Line Transmitter/Receiver 13

Tables

Table 1: WP-561 Model Functions 8
Table 2: WP-562 Functions 9
Table 3: CAT 5 PINOUT 10
Table 4: PT-561 HDMI Line Transmitter Features 11
Table 5: PT-562 HDMI Line Receiver Features 12
Table 6: Technical Specifications 14

1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 1,000-plus different models now appear in 11 groups[1] that are clearly defined by function.

Thank you for purchasing the Kramer Pico TOOLS **PT-561** *HDMI Line Transmitter,* **PT-562** *HDMI Line Receiver,* Kramer Wall Plates **WP-561** *HDMI Line Transmitter,* and the **WP-562** *HDMI Line Receiver,* which are ideal for:

- Board, conference, and training rooms
- Presentation systems
- Signal distribution and home theater

Each package includes the following items:

- **PT-561** *HDMI Line Transmitter* or **WP-561** *HDMI Line Transmitter* or **PT-562** *HDMI Line Receiver* or **WP-562** *HDMI Line Receiver*
- This user manual[2]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high-performance high-resolution cables[3]

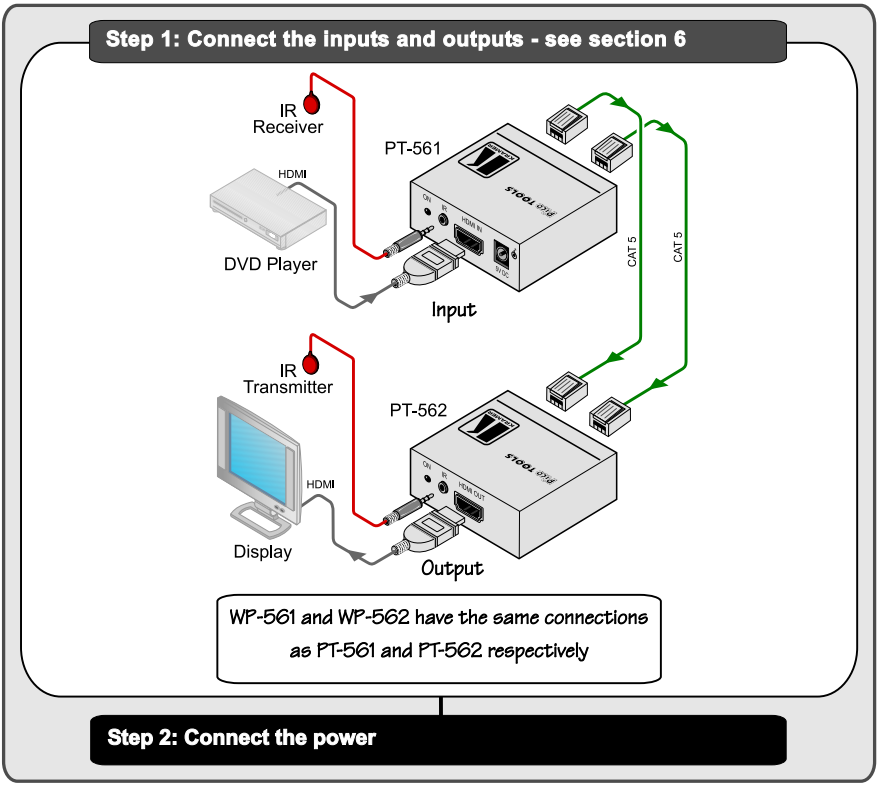
1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

2 Download up-to-date Kramer user manuals from our Web site at http://www.kramerelectronics.com

3 The complete list of Kramer cables is on our Web site at http://www.kramerelectronics.com

2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.



3 Overview

This section summarizes:

- The **WP-561 / PT-561** *HDMI Line Transmitter*, see section 3.1
- The **WP-562 / PT-562** *HDMI Line Receiver*, see section 3.2
- The power connect feature, see section 3.3
- Using shielded twisted pair (STP) or unshielded twisted pair (UTP), see section 3.4; about HDMI, see section 3.5
- Recommendations for achieving the best performance, see section 3.6

Using an HDMI Line Transmitter, the **WP-561** or **PT-561**, with an HDMI Line Receiver, the **WP-562** or **PT-562**, constitutes an HDMI-to-twisted pair transmitter and receiver system using two STP CAT 5 cables. The transmission range between the HDMI source and the HDMI acceptor can be extended to up to 50m (164ft) at 1080i and 20m (66ft) at 1080p.

3.1 WP-561 / PT-561 HDMI Line Transmitter

The Kramer **WP-561** *HDMI Line Transmitter* is a wall plate module that receives an HDMI signal, encodes it, and transmits it over two CAT 5 cables to the **WP-562** or **PT-562.**

The Kramer PicoTOOLS **PT-561** *HDMI Line Transmitter* is a standalone device that performs the same functions as the **WP-561**.

The **WP-561 / PT-561** features:

- An HDMI input and a pair of RJ-45 CAT 5 output connectors
- One power status LED
- Bandwidth up to 1.65Gbps
- The passing of EDID[1], HPD[2] and CEC[3] signals from the source to the display device using the CAT 5 cables
- A bi-directional IR input/output the transmitting and receiving IR commands over the CAT 5 cable
- Power Connect™ feeding[4] 5V DC over the CAT 5 cable from transmitter to receiver

1 Extended Display Information Data

2 Hot Plug Detect

3 Consumer Electronics Control

4 Powering via the CAT 5 cable from either the receiver or the transmitter is good for 50 meters. Above it, both sides should be fed with power

3.2 WP-562 / PT-562 HDMI Line Receiver

The Kramer Wall Plate **WP-562** *HDMI Line Receiver* is a wall plate module that receives an encoded signal over two CAT 5 cables transmitted from the **PT-561** or **WP-561**, decodes it, and converts it to an HDMI output.

The Kramer PicoTOOLS **PT-562** *HDMI Line Receiver* is a standalone device that performs the same functions as the **WP-562**.

The **WP-562 / PT-562** features:

- An HDMI output and a pair of RJ-45 CAT 5 input connectors
- One power status LED
- Bandwidth up to 1.65Gbps
- The passing of EDID, HPD and CEC signals from the source to the display device using the CAT 5 cables
- A bi-directional IR input/output the transmitting and receiving IR commands over the CAT 5 cable
- Power Connect™ feeding 5V DC over the CAT 5 cable from transmitter to receiver

3.3 About the Power Connect™ Feature

The Power Connect™ feature applies as long as the cable can carry power. The distance does not exceed 50 meters on standard CAT 5 cable, for longer distances, heavy gauge cable should be used[1].

For a CAT 5 cable exceeding a distance of 50 meters, separate power supplies should be connected to the transmitter and to the receiver simultaneously.

3.4 Shielded Twisted Pair (STP) / Unshielded Twisted Pair (UTP)

We recommend that you use shielded twisted pair (STP) cable. There are different levels of STP cable available, and we advise you to use the best quality STP cable that you can afford. Our STP skew-free cable, Kramer **BC-SXTP**, is intended for transmitting VGA signals. Our non-skew-free cable, Kramer **BC-STP,** is intended for digital signals.
The compliance to electromagnetic interference was tested using STP cables, therefore we recommend using those cables.

1 CAT 5 cable is still suitable for the video/audio transmission, but not for feeding the power at these distances

Although unshielded twisted pair (UTP) cable might be preferred for long range applications, the UTP cable should be installed far away from electric cables, motors and so on, which are prone to create electrical interference. However, since the use of UTP cable might cause inconformity to electromagnetic standards, Kramer does not commit to meeting the standard with UTP cable.

3.5 About HDMI

High-Definition Multimedia Interface (HDMI) is an uncompressed all-digital[1] audio/video interface, widely supported in the entertainment and home cinema industry. It delivers the highest high-definition image and sound quality. Note that Kramer Electronics Limited is an HDMI Adopter[2] and an HDCP Licensee[3].

In particular, HDMI:

- Provides a simple[4] interface between any audio/video source, such as a set-top box, DVD player, or A/V receiver and video monitor, such as a digital flat LCD / plasma television (DTV), over a single lengthy[5] cable
- Supports standard, enhanced, high-definition video, and multi-channel digital audio[6] on a single cable
- Transmits all ATSC HDTV standards and supports 8-channel digital audio, with bandwidth to spare to accommodate future enhancements and requirements
- Benefits consumers by providing superior, uncompressed digital video quality via a single cable[7], and user-friendly connector
- Is backward-compatible with DVI (Digital Visual Interface)
- Supports two-way communication between the video source (such as a DVD player) and the digital television, enabling new functionality such as automatic configuration and one-button play

1 Ensuring an all-digital rendering of video without the losses associated with analog interfaces and their unnecessary digital-to-analog conversions

2 See http://www.hdmi.org/about/adopters_founders.asp

3 See http://www.digital-cp.com/list/

4 With video and multi-channel audio combined into a single cable, the cost, complexity, and confusion of multiple cables currently used in A/V systems is reduced

5 HDMI technology has been designed to use standard copper cable construction at up to 15m

6 HDMI supports multiple audio formats, from standard stereo to multi-channel surround-sound. HDMI has the capacity to support Dolby 5.1 audio and high-resolution audio formats

7 HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner

HDMI has the capacity to support existing high-definition video formats (720p, 1080i, and 1080p/60), as well as standard definition formats such as NTSC or PAL.

3.6 Achieving the Best Performance

To achieve the best performance:

- Use only good quality connection cables[1] to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables).
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality and position your Kramer devices away from moisture, excessive sunlight and dust

4 Your WP-561, WP-562 HDMI Transmitter/Receiver Pair

This section describes:

- The **WP-561** *HDMI Line Transmitter* (see section 4.1)
- The **WP-562** *HDMI Line Receiver* (see section 4.2)

4.1 Your WP-561 HDMI Line Transmitter

Figure 1, Figure 2, Figure 3, and *Table 1* define the transmitter module.

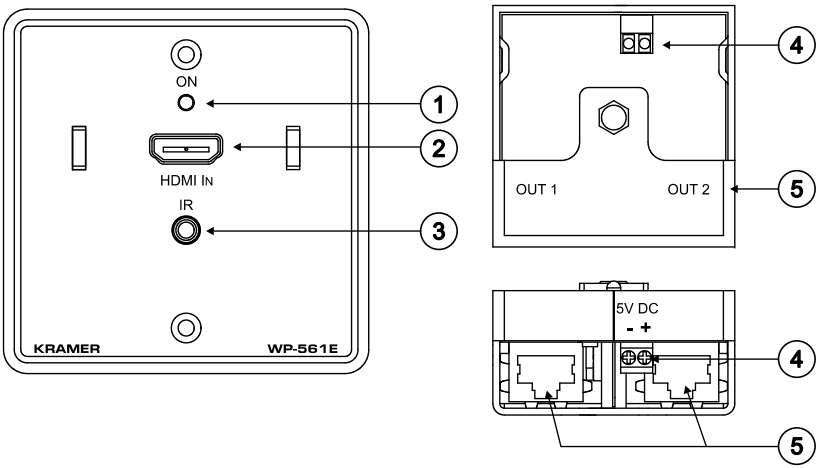


Figure 1: WP-561 Belgian/German Model Functions

1 Available from Kramer Electronics on our Web site at http://www.kramerelectronics.com

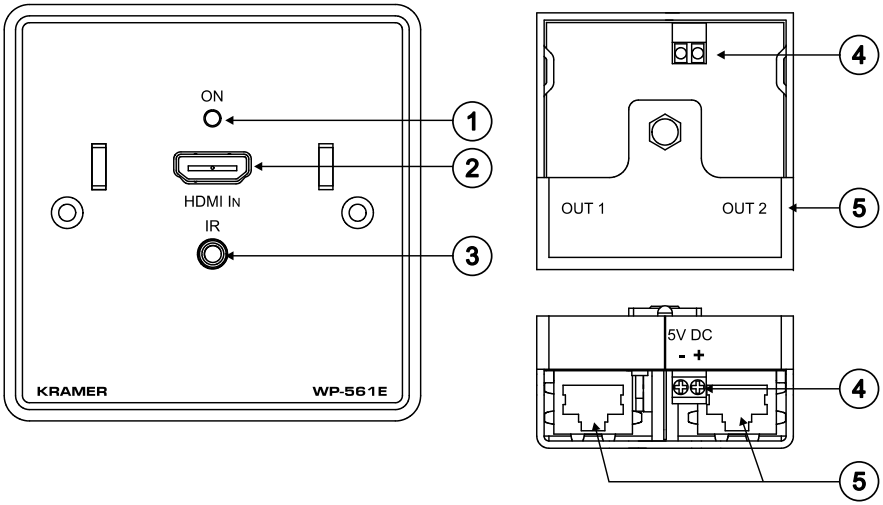


Figure 2: WP-561 UK/European Model Functions

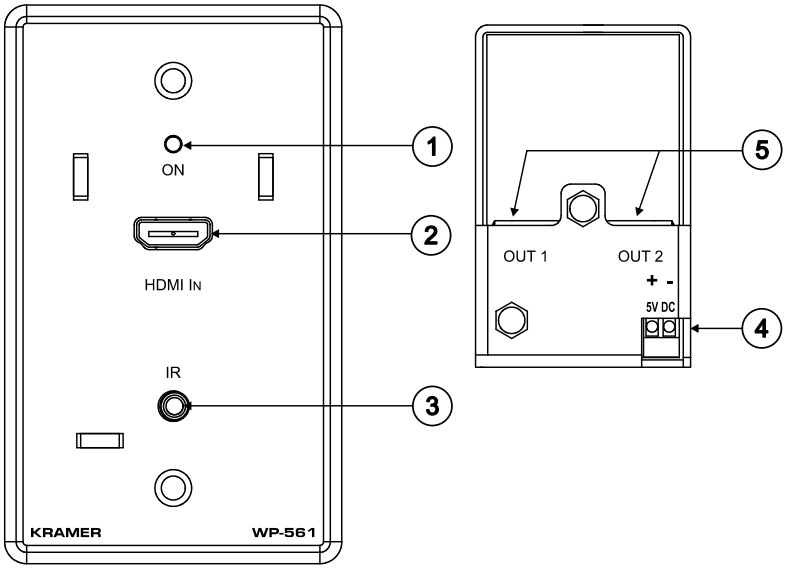


Figure 3: WP-561 US Model Functions

Table 1: WP-561 Model Functions

#	Feature	Function
1	*ON* LED	Illuminates red when powered on, green when transmitting data
2	*HDMI IN* Connector	Connects to an HDMI source
3	*IR* 3.5mm Mini Jack Connector	Connects to an IR receiver or IR transmitter
4	*5V DC*	Terminal block connector
5	*OUT 1* Connector	Connects to the IN 1 RJ-45 connector on the WP-562
	OUT 2 Connector	Connects to the IN 2 RJ-45 connector on the WP-562

4.2 Your WP-562 HDMI Line Receiver

Figure 4, Figure 5, Figure 6, and *Table 2* define the receiver module.

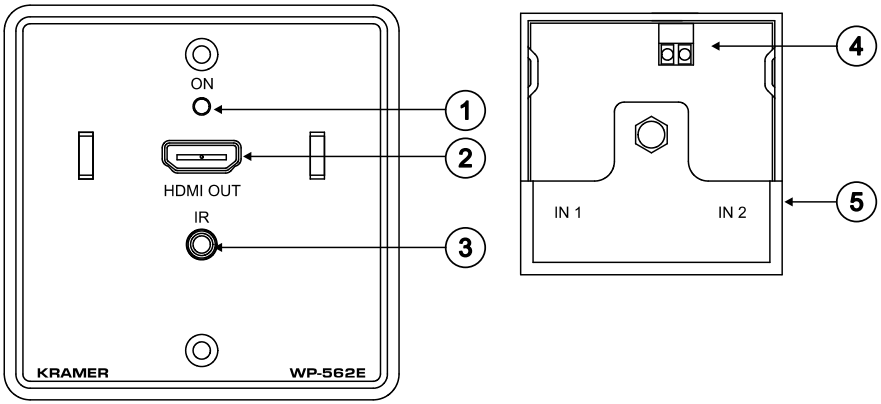


Figure 4: WP-562 Belgian/German Model Functions

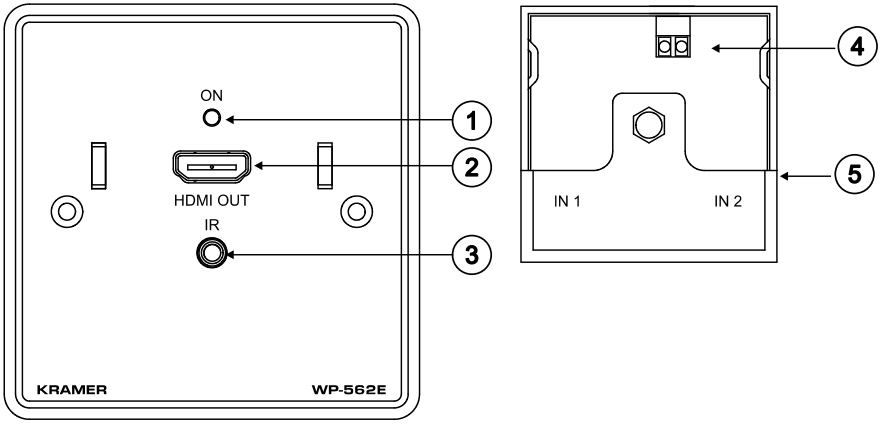


Figure 5: WP-562 UK/European Model Functions

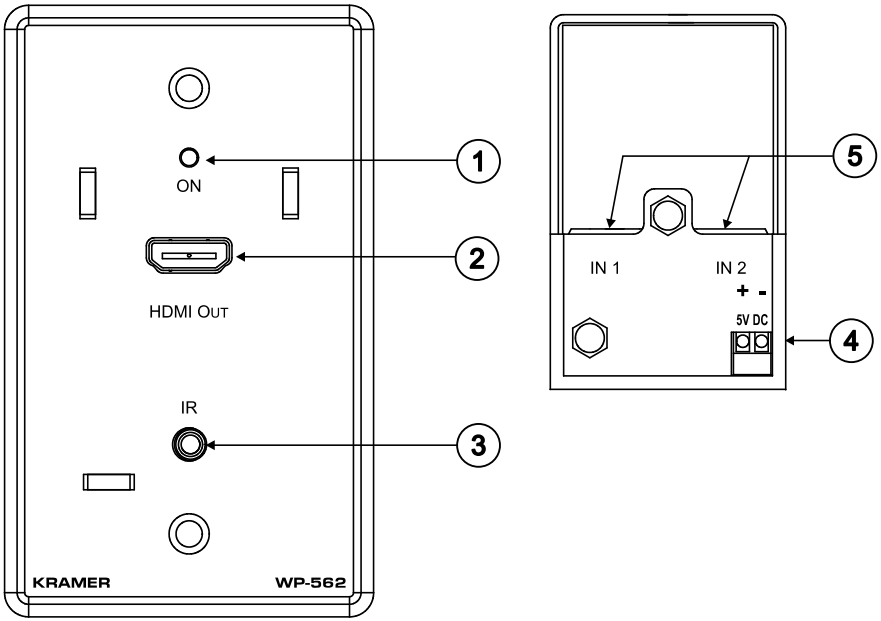


Figure 6: WP-562 US Model Functions[1]

Table 2: WP-562 Functions

#	Feature	Function
1	*ON* LED	Illuminates red when powered on, green when transmitting data
2	*HDMI OUT* Connector	Connects to an HDMI acceptor
3	*IR* 3.5mm Mini Jack Connector	Connects to an IR transmitter or IR receiver
4	*5V DC*	Terminal block connector
5	*IN 1* Connector	Connects to the OUT 1 RJ-45 connector on the **WP-561**
	IN 2 Connector	Connects to the OUT 2 RJ-45 connector on the **WP-561**

5 Connecting the WP-561/WP-562 Transmitter/Receiver Pair

To install the **WP-561** *HDMI Line Transmitter*:

1. Connect the CAT 5 cable 1 RJ-45 connector to the *OUT 1* RJ-45 socket.
2. Connect the CAT 5 cable 2 RJ-45 connector to the *OUT 2* RJ-45 socket.
3. Connect the 5V DC power to the terminal block pins[2], taking care that the **polarity is correct**.

1 The WP-562 US model receives power only by means of the Power Connect feature

2 Connect the wire labeled "+" to the +5V pin, and the wire labeled "–" to the GND pin

4. Insert the **WP-561** directly into the wall box opening, and then mount the front panel securely using the screws.
5. Connect the HDMI source to the *HDMI IN* 15-pin HD (F) connector.

To install the **WP-562** *HDMI Line Receiver*:

1. Connect the CAT 5 cable 1 RJ-45 connector to the *IN 1* RJ-45 socket.
2. Connect the CAT 5 cable 2 RJ-45 connector to the *IN 2* RJ-45 socket.
3. Insert the **WP-561** directly into the wall box opening, and then mount the front panel securely using the screws.
4. Connect the HDMI acceptor to the *HDMI Out* 15-pin HD (F) connector.
5. If the Power Connect[1] feature is not used, connect a 5V DC source to the terminal block.

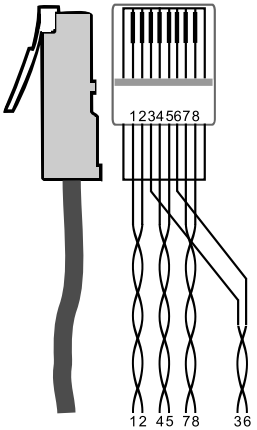
5.1 Wiring the CAT 5 LINE IN / LINE OUT RJ-45 Connectors

Table 3 and *Figure 7* define the CAT 5 pinout, using a straight pin-to-pin cable with RJ-45 connectors:

Table 3: CAT 5 PINOUT

EIA /TIA 568A		EIA /TIA 568B	
PIN	**Wire Color**	**PIN**	**Wire Color**
1	Green / White	1	Orange / White
2	Green	2	Orange
3	Orange / White	3	Green / White
4	Blue	4	Blue
5	Blue / White	5	Blue / White
6	Orange	6	Green
7	Brown / White	7	Brown / White
8	Brown	8	Brown
Pair 1	4 and 5	Pair 1	4 and 5
Pair 2	3 and 6	Pair 2	1 and 2
Pair 3	1 and 2	Pair 3	3 and 6
Pair 4	7 and 8	Pair 4	7 and 8

Figure 7: CAT 5 PINOUT



1 See section 3.3

6 Your PT-561, PT-562 HDMI Transmitter/Receiver Pair

This section describes the:

- **PT-561** *HDMI Line Transmitter*, see section 6.1
- **PT-562** *HDMI Line Receiver*, see section 6.2

6.1 Your PT-561 HDMI Line Transmitter

Figure 8 and *Table 4* define the **PT-561**:

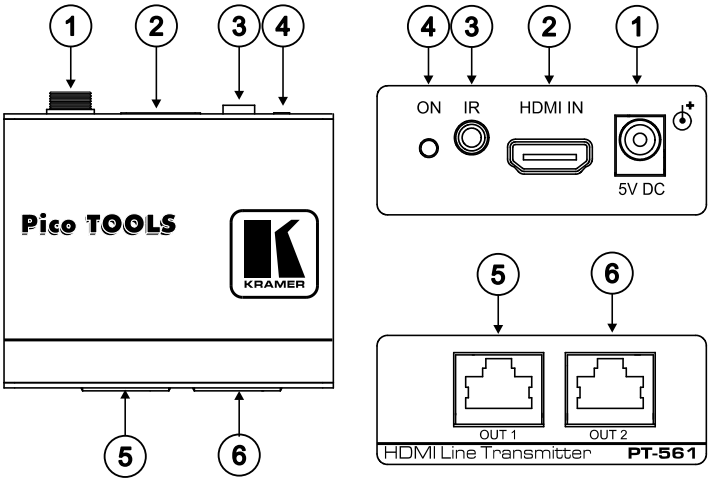


Figure 8: PT-561 HDMI Line Transmitter

Table 4: PT-561 HDMI Line Transmitter Features

#	Feature	Function
1	*5V DC*	+5V DC connector for powering the unit
2	*HDMI IN* Connector	Connect to the HDMI source
3	*IR* 3.5mm jack	Connects to an infrared transmitter or receiver
4	*ON* LED	Lights red when receiving power only, yellow when either input or output is attached, and green when both input and output are attached
5	*OUT 1* RJ-45 Connector	Connect to the IN 1 RJ-45 connector on the **PT-562**
6	*OUT 2* RJ-45 Connector	Connect to the IN 2 RJ-45 connector on the **PT-562**

6.2 Your PT-562 HDMI Line Receiver

Figure 9 and *Table 5* define the **PT-562**:

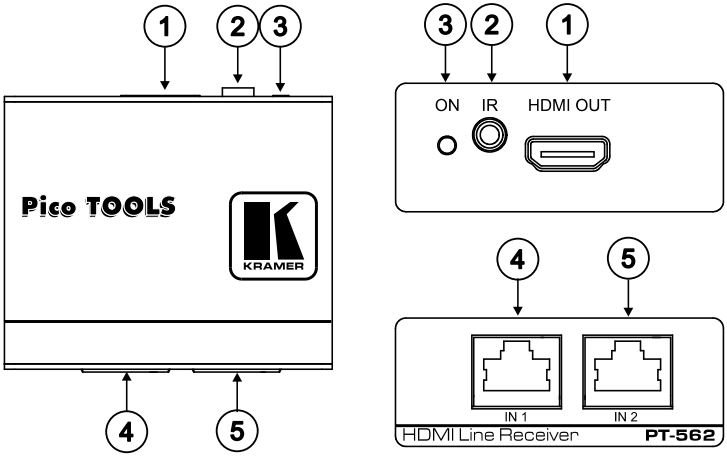


Figure 9: PT-562 HDMI Line Receiver

Table 5: PT-562 HDMI Line Receiver Features

#	Feature	Function
1	*HDMI OUT* Connector	Connect to the HDMI acceptor
2	*IR* 3.5mm jack	Connects to an infrared transmitter or receiver
3	*ON* LED	Lights red when receiving power only, yellow when either input or output is attached, and green when both input and output are attached
4	*IN 1* RJ-45 Connector	Connect to the OUT 1 RJ-45 connector on the **PT-561**
5	*IN 2* RJ-45 Connector	Connect to the OUT 2 RJ-45 connector on the **PT-561**

7 Connecting the PT-561 and PT-562

You can use the **PT-561** *HDMI Line Transmitter* with the **PT-562** *HDMI Line Receiver* to configure an HDMI transmitter/receiver system.

To connect the **PT-561** to the **PT-562**, as illustrated in the example in *Figure 10*, do the following:

1. Connect the CAT 5 OUT 1 and 2 RJ-45 connectors on the **PT-561** to the CAT 5 IN 1 and 2 RJ-45 connectors on the **PT-562** respectively, via two CAT 5 cables (see section 5.1).
2. On the **PT-562**, connect the HDMI OUT connector to an HDMI acceptor (for example, a plasma display).

3. Connect the 5V DC power adapter to the power socket and connect the adapter to the mains electricity to the **PT-561**[1] (not shown in *Figure 10*).
4. On the **PT-561**, connect an HDMI source (for example, a DVD player) to the HDMI IN connector.

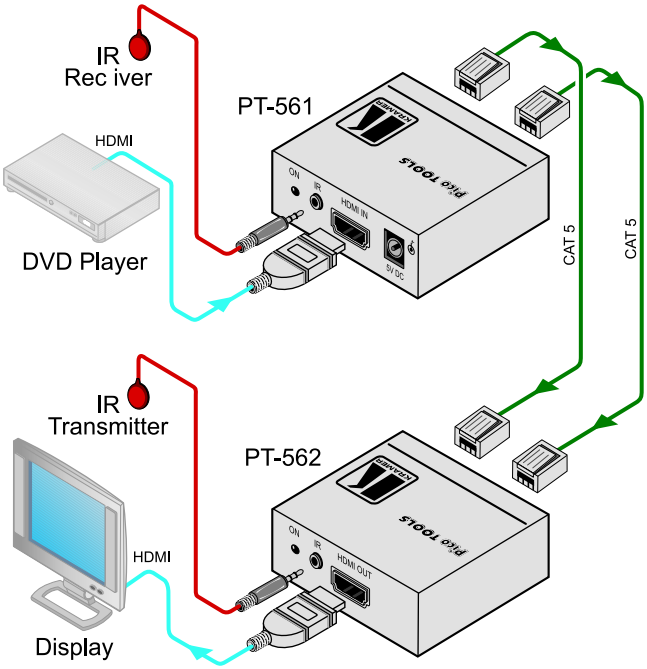


Figure 10: Connecting the PT-561 / PT-562 HDMI Line Transmitter/Receiver

1 If not using the Power Connect feature, connect a 5V source to the PT-562 as well

8 Technical Specifications

The technical specifications for **WP-561/WP-562** and **PT-561/PT-562** are shown in *Table 6*.

Table 6: Technical Specifications[1]

	WP-561/PT-561	WP-562/PT-562
INPUTS:	1 HDMI connector	2 CAT5 IN on RJ-45 connectors
OUTPUTS:	2 CAT5 OUT on RJ-45 connectors	1 HDMI connector
IR PORT:	Bi-directional on a 3.5mm mini jack	
BANDWIDTH:	Supports up to 1.65Gbps bandwidth per graphic channel	
COMPLIANCE WITH HDMI STANDARD:	Supports HDMI 1.3 and HDCP	
POWER SOURCE:	5V DC, 440mA (transmitter and receiver together)	
DIMENSIONS:	PT-561/PT-562: 6.2cm x 5.2cm x 2.4cm (2.4" x 2.1" x 1") W, D, H WP-561/WP-562: 6.9cm x 11.4cm x 2.9cm (2.7" x 4.5" x 1.1") W, D, H	
WEIGHT:	PT-561/PT-562: 0.14kg (0.3lbs) WP-561/WP-562: 0.2kg (0.4lbs)	
ACCESSORIES:	Power supply	
OPTIONS:	19" rack mount adapter	

1 Specifications are subject to change without notice

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
3. Damage, deterioration or malfunction resulting from:
   i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   ii) Product modification, or failure to follow instructions supplied with the product
   iii) Repair or attempted repair by anyone not authorized by Kramer
   iv) Any shipment of the product (claims must be presented to the carrier)
   v) Removal or installation of the product
   vi) Any other cause, which does not relate to a product defect
   vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

EN-50081:	"Electromagnetic compatibility (EMC); generic emission standard. Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC* Rules and Regulations: Part 15: “Radio frequency devices Subpart B Unintentional radiators”

CAUTION!

- Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- Use the supplied DC power supply to feed power to the machine.
- Please use recommended interconnection cables to connect the machine to other components.

  * FCC and CE approved using STP cable (for twisted pair products)

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com where updates to this user manual may be found.
We welcome your questions, comments and feedback.

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

Kramer Electronics, Ltd.
Web site: www.kramerelectronics.com
E-mail: info@kramerel.com
P/N: 2900-000388 REV 1